

PATHOLOGY AND BACTERIOLOGY

UNDER THE CHARGE OF

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A Remarkable Finding of Anthrax Spores in the Earth of a Burying Place.—The resistance of anthrax spores in infected earth is of the greatest hygienic importance. W. v. GOZENBACK (*Ztschr. f. Hyg. u. Infektionskrankh.*, 1915, lxxix, 336) reports the finding of anthrax spores in the earth of a place which had been used six years before for burying diseased animals. The place was wanted as a playground and the investigation was undertaken to determine whether it was safe for such use. The author recovered anthrax bacilli six times by animal injections and twice by direct plating. One ear gave four positive findings at the surface and from depths of 1.3 and 2 meters deep. Earth worms from these regions gave negative results. A cow buried in this particular place had been slaughtered there and remained twenty-four hours before burying. Moreover, the temperature at this time was 18° to 21° C. These facts led the author to conclude that the earth had been badly infected from the blood and body fluids of the slaughtered animal and that the bacilli in the soil thus polluted and under conditions of favorable temperature had actually grown. Many of the guinea-pigs used in these experiments appeared to have died from malignant edema and the confusion liable to arise from the resemblance of the two diseases and the morphology of the bacilli must be controlled by cultures.

Observations on the Antibacterial Action of Coins on Media.—NATONEK and REITMANN (*Ztschr. f. Hyg. u. Infektionskrankh.*, 1915, lxxix, 345) carefully review the literature on the action of different metals against bacteria. Many theories have been advanced. The theory given us as a result of their own experiments is that the metal exerts a direct action upon the bacteria. Electric currents between the metals, through the water of condensation of the media, bring about solution of the metal. Small particles of the metal in the moisture of the media are probably held in suspension. The oligodynamic activity against bacteria of solutions of the heavy metals is well known. The addition of insoluble substances to such a solution lessens or destroys the bactericidal action. The authors found in their experiments that when coins were placed on plates seeded with bacteria

no growth occurred under or in a circle surrounding the coin. This has been shown by many other observers. They further showed that when a coin was placed on an agar plate for a few hours and then removed the area under and about the coin showed no growth after smearing the plate with bacteria. If chalk or India ink were added to the plate before treatment with the coin no bactericidal action resulted. The same is true if the plate is very heavily seeded. When the coin was left on the plate for a long time (five days) and the plate then seeded, no interference with growth was found. This latter result the authors explain on the dilution of the substance or its alteration by oxidation. The other findings confirm the theory of the oligodynamic action of metals in solution. Agar treated with copper and silver coins was tested and copper was found in both cases and only a trace of silver from the silver coin.

Experimental Study of Distribution and Habitat of the Tetanus Bacillus.—The tetanus bacillus has been found most widely distributed in nature, from the mud of Lake Geneva and water of the Dead Sea to the arrows of the natives of New Herbrides. Its presence in dust, soil, wearing apparel, gun wads, and feces is of common knowledge. NOBLE (*Jour. Infect. Dis.*, 1915, xvi, 132) studied the distribution of tetanus bacilli among the herbivorous animals, particularly through the fecal excreta. The excreta of horses, cows and guinea-pigs were analyzed by the use of Smith's anaerobic method. The horses showed the presence of these organisms in 18 per cent., but no tetanus bacilli were found in the material from cows. In feeding tetanus organisms to guinea-pigs the spores were recovered on the seventh day after feeding. They found that animals having the organism in the intestine may, during certain seasons of the year, be free from infection. Some experiments show that the bacilli actually multiply while in the bowel. Those animals in which the bacilli appear normally may act as carriers for this organism and infect large areas.

The Effect of Industrial Dusts in the Production of Respiratory Diseases.—The importance of dust of various kinds as causative factors in respiratory diseases is being borne in upon us with greater weight. HEIM and AGASSE-LAFONT (*Arch. gén. de méd.*, 1914) after reviewing the various ill-effects of industrial dusts came to the conclusion that the classification should not rest upon the origin of the dust but rather upon the nature of its harmful influence. They recognize dusts of an active and passive nature. The effects of the first are toxic, predisposing or infectious, while the dusts acting passively act by their mere presence as foreign bodies upon the surfaces of the respiratory system. These passively acting materials may be of soft or hard consistency. The latter are more effective in bringing about the common chronic pneumokoniosis. They point out that the active agents are by far the most important in bringing about the acute respiratory diseases of which pneumonia and acute bronchitis are the most frequent. They do not follow the chronic lesions resulting from the passive agents to a conclusion to illustrate the increased predisposition of the damaged tissues to other secondary processes.

Therapeutic Leukocytosis.—The first appreciation of quantitative changes of leukocytes were observed in infectious diseases. Its common occurrence in infections brought forth many hypotheses of its development. Many believed that the bacterial toxins were directly responsible for leukocytosis and compared its occurrence with the experiments of Metchnikoff in which leukocytes actively combated the introduction of arsenic and other poisons into the body. In fact, the activity of leukocytes toward various poisons was demonstrated in connection with a variety of synthetic organic compounds. On the other hand, new views indicated an activity of leukocytes, not by a mere absorption of the poison, but by an elaboration of secretions which are antagonistic to the foreign substances. This argument has been much used in the discussions on immunity. The underlying factor in chemotaxis is not clear. It is evident that leukocytes are not equally attracted by all forms of infection, some types even causing them to disappear from the blood. There are some, however, that believe that the appearance of leukocytes in the blood is dependent upon their active discharge from the lymph channels while others believe that it is controlled by the activity of the bone-marrow. Many points governing the presence of leukocytes in the blood are not clear and it would appear that under different conditions different factors are active in determining their increase in the blood. In general, however, it would seem that the presence of increased numbers of leukocytes is related to their activity against toxins and bacteria, in the production of antibodies against these substances or in being driven from their natural sources (spleen, bone-marrow and lymph glands). The very fact that leukocytes bear such a close relation to the favorable results occurring in infectious diseases has suggested the institution of therapeutic measures, whereby a leukocytosis might be induced. This is far from being an untried field, for many authors have demonstrated an artificial leukocytosis through various substances. Although the list of substances which have been made use of is long, there are few of them which stand the practical test. In the majority of instances, the demonstration of an increased number of leukocytes after the use of a certain material has seemed sufficient evidence of its value. The control, however, by many tests among numerous patients or normal individuals has seldom been undertaken. Moreover, the experiments have shed but little light upon the manner in which the cell increase has taken place. Geurtz (*Ztschr. f. exper. Path. u. Therap.*, 1915, xvii, 161) studied the action of various antipyretics which are commonly considered to stimulate leukocytosis. He was unable to demonstrate any such definite change in the blood of patients under observation. There was likewise no alteration in the relative percentage of the various leukocytes after treatment.

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